numerous instances the larger blossoms of each family are so exclusively adapted to insect fertilisation that they cannot fertilise themselves; while among the smaller blossoms alternative devices for self-fertilisation commonly come into play after the flower has been open for some time, if it has not first been cross-fertilised. Structural considerations show us that in most of such instances the larger and purely entomophilous flowers are the more primitive, while the smaller and occasionally self-fertilising flowers are derivative and degraded, having usually lost some of their parts. Hence, in tracing the progressive law of colouration in the families generally, it is necessary, for the most part, to consider only the larger and more typical species, setting aside most of the smaller as products of degeneration. GRANT ALLEN

(*To be continued.*)

NOTE ON THE HISTORY OF OPTICAL GLASS

M. FEIL has been good enough to send us the following interesting particulars of the life of Pierre Louis Guinaud:—

Pierre Louis Guinaud was born at Bresset in the canton of Neuchatel, Switzerland, in 1742, and died in 1821. He was nearly sixteen years old when Herschel visited Switzerland, and with Alschneider made some telescopic experiments on the Tête Doran. Young Guinaud, who acted as shepherd by day, and at night worked in a bell manufactory, occasionally was present at the meetings of these gentlemen, and attracted their attention and good will by many services.

His curiosity was greatly aroused, and after having been allowed to look through the telescope, he asked Herschel to dismount the instrument, as he wished to see how it was made; doubtless struck by his wonderful intelligence, the illustrious *savant* showed him the details of its construction.

The following year this gentlemen returned to Switzerland with Dollond and Faraday. Young Guinaud must have utilised the intervening time, for he showed Herschel, whom he was able to call his benefactor, a telescope which he himself had made, the mirror being of bell-metal. Imperfect as such an instrument must necessarily have been, it proved his strength of will and aptitude for optics.

He had pondered over the subject and asked why large object-glasses had not been made? There are no glasses in existence suitable to make them," was the answer. "Make some, if you can," said Alschneider. "I will make some," replied Guinaud. But he required money. He set to work, and, being a clever workman, soon invented the bells of repeaters, which proved very lucrative. All that he earned was devoted to the establishment of small glass-works. What power of research and perseverance must this man have possessed, who, without any other resource but his genius, started the most difficult branch of glass making, in order to solve a problem which was incomprehensible to Faraday and Dartigères? For ten years everything was devoted to his work. One casting failed, and was thrown into the torrent which flowed at the foot of the mountain on which he had built his factory. He had chosen the highest and most inaccessible point, having to defend himself against the ignorance of his neighbours, who treated him as a sorcerer, and several times his place was sacked. He utilised a stream of water in order to work a hydraulic wheel for the pulverisation of these materials, the sawing and working up of these blocks of glass. Nevertheless, the attention of the scientific world was already drawn to the modest worker. Alschneider had become his friend. About 1806 he sold a disc of six inches to Lerebours, and at nearly the same time he sent an eight-inch to Dollond; the problem was solved. He furnished Panchoni and Lerebour with discs of twelve inches. The twelve-inch object-glass belonging to Causham was bought for 2,500 francs by Faraday. Alschneider begged him to go to Munich and associate himself with Fraunhofer. But at the end of about three years the desire to see his mountains again took possession of him, and he renounced all his advantages and returned to continue his work alone. France offered him a pension from the state, a secret patent for fifteen years, and a factory fully established; but he refused to accede to the offers of the minister of Vitellius, and died in 1821. After his death his son, Henri Guinaud, who had always lived in France from the age of fifteen, was put into communication by Lerebours with MM. Bontemps and Thibaudau, proprietors of the glass-works at Choisy-le-Roi. He had seen several experiments during the journeys he had taken with his father. He taught these gentlemen all he knew of his father's processes, but, obliged by penury to quit them, he returned to Paris, and founded, with his son-in-law, M. Feil, my father, a small glass-work in the Rue Mouffetard. This was in 1832.

In 1838 Henri Guinaud received the gold medal of the Academy of Sciences, in 1839 the great prize in astronomy, one part of which was given to M. Bontemps. He presented to the Academy of Sciences a disc of eighteen inches diameter. I succeeded him in 1848, and was his pupil for six years. He died in 1851, carrying with him the regrets of all scientific men, who, like the Aragos, Gambays, Thénards, and Dumas, had appreciated his cleverness and his talents, and who were his friends and protectors.

NOTES

THE French Association for the Advancement of Science meets this year at La Rochelle, on the 24th inst., for its eleventh session. M. Janssen is the President-elect. Two lectures are to be delivered, one by M. Bouquet de la Grye, on the deep water harbour of La Rochelle; the other by M. Hospitalier, on the electric light. There will be excursions to the places where oysters and mussels are cultivated. Deep-sea dredging will take place on board the *Ardisnade*, under the direction of Prof. Giard, of Lille. A reduction of 50 per cent. will be granted on the French railways to the members of the Association. Among foreign *savants* expected to attend the meeting are Prof. Hennessy of Dublin, Prof. van Beneden of Louvain, with several other Belgians, Prof. Baehr of Delft, and two other Dutch *savants*, Signor Denza, of Moncalieri Observatory, and two other Italians, Chevalier di Silva, Royal Architect, from Lisbon, Prof. Vittanova of Madrid, and M. de Loriol of Geneva. Among the subjects of papers we note briefly the following:—The Channel Tunnel; American glaciers; transformation of work into heat, and reciprocally; marbles of Italian quarries; employment of portable railways in the war in Tunis; geodetic works in Italy; the salubrity of collective dwellings; aërodynamics and solar heat; the topoveloce; a new gyroscopic box; a geometrical generation of Fraunhofer's lines; theory of vowels; isotherms on mountains; registering capillary electrometer; new pressure-anemograph; best coloured signals for beacons, &c.; sulphurous acid in Lille atmosphere; aërial navigation; photometry for light of different colours; severe winters; distribution of the atmosphere in the two hemispheres; ammoniacal fermentation; determination of salicylic acid in alimentary substances; action of oxalic acid on polyatomic alcohols; formation of alkaloids in protoplasm; bases of the quinoleic series; electro-therapeutic treatment of vomiting; double consciousness; teas of commerce; anæsthesia in croup; anthropology of evolution; the cause of goitre; intestinal parasites of oysters; thermal waters in the

Mediterranean basin; physiology of the nervous system; ocular hygiene; yellow fever; the Verbenaceæ; mints of France; European clover; funeral furniture of a dolmen; a palæolithic and neolithic station (see the *Revue Scientifique*, July 27 and August 5).

THE remains of the late Prof. Balfour were, on Saturday, nterred at Whittingham.

THE British Medical Association is holding its fiftieth annual meeting this week (beginning Tuesday, the 8th inst.) at Worcester, the city of its birth, under the presidency of Dr. W. Strange, of Worcester Infirmary. Among other events, a bust of Sir Charles Hastings (to whom the Association mainly owes its origin) is to be presented to the city.

A SEVERE earthquake is reported to have been felt in Chios (August 7), but no damage was done.

IT has been announced that an "Exhibition of Practical Electric Development," with reference chiefly to telephones, electric lighting, transmission of power, and the economical application of electric energy to practical work, will be held in the Royal Aquarium, Westminster, from November 1, 1882, till March 1, 1883. Prizes amounting to a total of 1000*l.* will be awarded by a Committee which the scientific societies will be invited to nominate. The subjects (in brief) are:—1. Best system of storage and generator for railway systems; generator to be worked from axle of train. 2. Best systems of storage battery, large and small. 3. Design in models, showing the best method of utilising (*a*) wind or water, (*b*) tidal forces for electrical storage. 4. Best electromotor for stationary or tramcar work (three kinds). 5. Best automatic (shunt or otherwise) system of dynamos for compensating change of resistance in external circuit, and economising power absorbed by machine. (6) Best model or drawing (with estimates) of central stations for 20,000 electric lights over a radius of one mile. 7. Best electric meter for houses. 8. Best set of twenty-five fancy fittings for electroliers. 9. Best set of fittings for restaurant or hotel bars, and counters. 10. Best application of electric light fittings to photographic studio. 11. Best fittings, &c., for drawing and other private rooms. 12. Best system of street mains or leads for public supply. 13. Best electric couplings for trains. 14. Best photometer, if possible, self-recording. 15. Best electro dynamo-meters (*a*) for direct, and (*b*) for alternating currents; both in one instrument. 16. Best thermopile for utilisation of waste heat and conversion into light or power by means of storage. 17. Best lamp for mine or sub-marine operations. 18. Most complete apparatus for remedial appliances, especially with regard to use of a bath in which the patient is immersed. Applications for space must be made (for England) not later than August 21.

THE *Times* Correspondent in Paris mentions having seen, at a recent popular *fête* at the Tuileries, a solar apparatus set in motion a printing machine, which printed several thousand copies of a specimen newspaper called the *Soleil Journal*. He also saw cider and coffee made with its aid, and a pump set in motion. He suggests the use of such apparatus for troops in Egypt and India.

WE are glad to learn that there is some prospect of an addition being made shortly to the small number of technical schools at present existing in this country, and that in a district where such a school, if properly organised, should prove of great utilty, viz., Cleveland. Mr. Samuelson, M.P., whose active interest in the subject of technical education has been so fruitful, has been discussing with some of the leading manufacturers in Cleveland the propriety of establishing a science school, having special reference to chemistry and metallurgy, at Middlesborough, and we understand that the proposal has been received with general approbation, and a definite scheme will soon be put forth. It is estimated by Col. Festing that a building, including a lecture theatre to hold over 200, and all necessary accommodation, would cost at least 2500*l.*, and that the laboratory fittings, &c., would cost 600*l.*; but it would be essential to look for a present expenditure of from 5000*l.* to 6000*l.*, exclusive of land. As to maintenance, the institution would have a fixed revenue from fees; there will be payment for results, and some help towards a sustentation fund is looked for from the City Guilds of London. The cost of laboratory fittings would doubtless be partly met from South Kensington. Mr. Samuelson is prepared we hear, not only to contribute liberally towards the funds required for the institution, but also to give his personal and practical aid in the working out of the scheme. A meeting of those who sympathise with the movement will shortly be held, at which he and others will fully explain the objects and mode of operation. We trust that in the organisation of this school, due regard will be had to the interests of pure science, a thorough grounding in which is essential to true progress, on the part of the apprentice, in technical study.

MR. O'NEILL, H.B.M. Consul at Mozambique, has recently reported to the Foreign Office that from Mr. James Heathcote, of Inhambane (who was employed by him for the recovery of the body of the late Capt. Wybrants), he has received information of the discovery of a considerable tract of copal forest. Mr. Heathcote writes: "The forest where I obtained this gum, of which I send you specimens (I have collected six tons) is fully 200 miles long. It is a belt which runs parallel with the coast, and is midway between the coast and the first range of mountains. From Inhambane it is nearly 100 miles to get right into it." The distance of the forest from Inhambane is a little great, and may retard its being opened up; but its discovery adds to the known wealth of the district, and a new export to the place. Mr. Heathcote points out the following curious coincidence, and although it may not be the first time that attention has been drawn to it, the Consul mentions it: "The native name of this gum is 'Stakate' and 'Staka.' The Zulu name for gum is 'Inthlaka.' The name 'Stacte' mentioned in Exodus xxx. 34 (this is believed to be the gum of the Storua tree, *Styrax officinale*), would be pronounced as the above native name. The tree domineers over all, and standing in any place overlooking the forest, you see here and there trees growing as it were in a hayfield. The gum has a beautiful odour if pounded and burnt, also if boiled in a pot of water." The ordinary gum copal tree of the mainland of Zanzibar and Mozambique, though as a rule lofty, is by no means of the striking stature indicated by Mr. Heathcote's comparison.

THE Iron and Steel Institute hold an Autumn meeting in Vienna this year, from Tuesday, September 19th to the 23rd. Besides visits to engineering and other works in Vienna, and various entertainments, alternative excursions are arranged (for the 22nd) to Leoben and Gratz in Styria, and to Buda-Pesth, in Hungary.

THE American Committee for the Darwin Memorial (to cooperate with the English Executive Committee) has for its chairman Prof. Asa Gray; treasurer Prof. Alex. Agassiz. The other names are those of Baird, Dana, Eliot, Gilman, Hall, Leconte, Leidy, Marsh, Mitchell, Newcomb, Norton, Walker, and Wooley.

THE United States Bureau of Education issued not long ago a circular on the subject of Spelling Reform, which the Commissioner, General Eaton, pronounces to be of great importance. It contains a report, dated 1877, from four or five professors, who, after three years' discussion of the subject by the American Philological Association, were appointed a committee with recommendations which have been carried out as to reorganising the alphabet and cutting types to express distinct sounds now represented by one letter; also a similar Report of the Spelling Reform Association, with such new characters recommended both for printing and writing; and five new rules for writing words with present letters, which have become widely known, and a rather longer code of desirable changes. The circular contains also a sanguine account of the support and success that the movement has had in the States. It is a most interesting *résumé* of what amount of agreement has been arrived at among phonetic spellers and the moderate changes which they urge should be adopted first. But there are signs in it that there is small hope of all English-speaking nations agreeing upon a uniform standard of pronunciation, still less of their agreeing to represent uniformly the sound of such words in print; the result, therefore of the adoption of phonetic spelling must be the break-up of the English language, which it might have been hoped, would have become the language common to at least half the civilised earth. Each country—and it is hard to say how small division of each country—would soon have a brogue of its own, whose steadily increasing differentiation from all others will have nothing to check it. We have before our eyes now the small beginning of a natural confusion of tongues which the Hebrews of old well knew to be a curse, though ignorant of the process of evolution.

A USEFUL little "Guide to Southampton and Neighbourhood" has been prepared by Mr. Thomas W. Shore, of the Hartley Institution in that town, in view of the approaching visit of the British Association. A few pages are devoted to notes on climate, vital statistics, geology, botany, zoology, &c.

A PROPOSAL has been made to the Municipal Council of Paris to give the name of Miss Sophie Germain to one of the newly opened streets. This lady was a clever mathematician, who died about fifty years ago, and left some papers relating to high analysis.

THE Astronomical and Meteorological Bulletin of the Observatory of Rio de Janeiro (April number) has an account of solar observations by M. Lacaille, on nine separate days in February–April, with reference to variations of the solar diameter. The solar image was thrown on a screen which had a series of parallel lines directed perpendicularly to the diurnal motion. The passages of the sun's border over those lines were recorded in a chronograph. Each of the tables (referring to one day's observations) gives the angle of position of the solar equator reckoned from north towards east, the angle, north or south of the solar equator, which the diameter measured makes with the latter, the radius vector of the earth's orbit, and the sun's declination. The difference between the time of passage of the semi-diameter deduced from observation and that given by the *Nautical Almanac* is in general very small; it does not exceed 0·10s.

IN consequence of the long time which elapses between the meetings of the Meteorological International Congress, the President, Dr. Wilde, of St. Petersburg, has decided to form a permanent Committee to meet once a year, in order to examine and record the materials collected within such time. The first meeting of the Committee has just taken place in Copenhagen, lasting from the 2nd to the 5th inst.

THE Argentine Republic is at present organising two stations for observation of the transit of Venus; the first at Buenos Ayres, the second in the south of the province, in the environs of Tandil. One expedition is organised at the expense of the Argentine Government, and the other at that of the province of Buenos Ayres. The instruments have been ordered from M. Gautier, Paris; they are 6-inch and 8-inch equatorials. The two observatories are meant to become permanent; the Republic will then possess three, the principal one being that at Cordoba, established by M. Gould. The enlightened Governor of Buenos Ayres, M. Dando Rocha, has decided to carry out a scientific work of the first importance, viz. measurement of a meridian arc of 7° or 8°, which will serve as base for a geodetic map of the Argentine Confederation, and be of great interest for determining the form of the earth (southern measurements of the kind being very few).

WE have received from M. E. Hospitalier (whose work on the Modern Applications of Electricity, as translated and enlarged by Mr. Julius Maier, we reviewed in NATURE, vol. xxvi. p. 289) a letter, too long to insert in its entirety, complaining that for most of the points adversely criticised by us he is not responsible. He has courteously sent us a copy of the original edition, in French, of his work, that we might assure ourselves that his repudiation of what he justly terms *errors against common sense* was justified. M. Hospitalier protests against having been made to confound the *ampère* with the *coulomb*. He points out that in describing Edison's armature he described it as being founded in principle upon that of Siemens, not that of Gramme. He calls attention to the passage of his work where he says: "La machine Pacinotti a figuré à l'Exposition et a valu à son inventeur un diplôme d'honneur. Sa *priorité* et son identité de principe avec la machine Gramme *ne peut donc être contestée aujourd'hui.*" (The italics are M. Hospitalier's). We willingly accord to M. Hospitalier the claim he makes to repudiate the blunders for which he is not responsible, but we think he is a little too severe when he writes us that he is experiencing the truth of the Italian proverb, *traduttore, tradittore*.

WE observe that a correspondent of a daily paper proposes that men addicted to the pursuits of science should be called *scientiates*, after the Italian *scienziati*; and in like manner the studies of science, *sciential* studies (*studj scienziali*). The substitution of the American *scientist* for our unsatisfactory phrase *men of science* is of course much to be deprecated; perhaps we shall come to accept Sir William Thomson's proposed use of *naturalist* for the designation in question, if its sense may be extended. *Scientific studies* is a phrase which cannot be commended for accuracy.

WE have received a letter from Rio de Janeiro stating that M. Crüls, the Imperial astronomer *pro tem.*, has established a time-ball similar to that at the Greenwich Observatory.

EXPERIMENTS have been made at Havre to test a system of telephony between the Roads and the city. They have been so successful that it has been proposed to form a pontoon structure at a distance from the land, on board of which public telephones should be placed for use by the shipping in communicating with the land.

THE credit for the French mission for the Venus transit has been recently voted by both Houses of Parliament, and amounts to 18,000*l*.

THE Budget Committee of the Chamber of Deputies proposes to the House to spend a sum of 3680*l*. for microscopical inspection of bacon and other meat liable to be infected with trichinæ. A special tax will be imposed on such goods for that purpose. There is a decided tendency to make the microscope an instrument of common use in the hands of the French administration.

THE conditions of habitability of Mars are discussed by M. Flammarion in the August issue of his excellent new journal, *L'Astronomie*. With S. Schiaparelli (who describes his recent observations in the same number), he accounts for the striking variability of geographical configuration of the planet by supposed alternate inundations and dessication of water, due to water-transformations much more important than those on our globe. There are also papers on Venus and her satellite, the tides in the Mediterranean, the heavens in August, &c.

A CURIOUS and little-known experiment, showing the resistance of the air in guns, is described by Prof. Daniel Colladon, of Geneva, in a recent letter to M. Melsens (*Bull. Belg. Acad.* No. 6). He was long in the habit of showing it to his classes. It resembles a feat that was sometimes performed by soldiers with the old Swiss carbines. M. Colladon fully charged with compressed air the hollow iron breech of an air-gun, serving as reservoir. Having screwed up the gun, he introduced a round lead ball, running freely, but nearly filling the bore; then, placing the gun vertical, he seized the upper end and pressed his thumb vigorously on the mouth. The gun was then "fired" by an assistant; the thumb remained in position, and the ball was heard to fall back in the bore. Thereupon, after recharging the breech and with the same ball, he shot the latter at a pine board about ·4 in. thick, or a pane of glass, and it passed through. The experiment, M. Colladon says, is without danger, if the operator is sure of the strength of his thumb, if the gun is more than 32 in. long, and if the ball is spherical and nearly fills the gun (in which it must act like a piston). The least uncertainty in the very vigorous pressure of the thumb, and hermetic closure of the gun, may entail serious injury to the thumb. While M. Colladon has repeated the experiment twenty or thirty times, without the least inconvenience either from shock or heat, a trial of it is perhaps hardly to be recommended.

THE additions to the Zoological Society's Gardens during the past week include a Common Raccoon (*Procyon lotor*) from North America, presented by Mr. Mark Vice; a Passerine Owl (*Glaucidium passerinum*), European, presented by Miss Maud Howard; six Common Guillemots (*Uria troile*), European, presented by Sir Hugh Dalrymple, Bart.; an Allen's Porphyrio (*Porphyrio alleni*), captured at sea, presented by Master J. Kennedy; forty Restless Cavies (*Cavia caprera*), British, presented by H.R.H. the Prince of Wales, K.G.; a Four-rayed Snake (*Elaphis quaterradiatus*), South European, presented by Capt. Adams; a Smooth Snake (*Coronella lævis*), British, presented by Mr. W. Penney; an Egyptian Cobra (*Naia haje*) from South Africa, presented by Mr. Eustace Pillans; a Common Viper (*Vipera berus*), British, presented by Mr. H. J. Benwell; a Lesser White-nosed Monkey (*Cercopithecus petaurista*) from West Africa, a Grey Ichneumon (*Herpestes griseus*) from India, a Goffin's Cockatoo (*Cacatua goffini*) from Queensland, a White-headed Sea Eagle (*Haliaetus leucocephalus*) from North America, a Chequered Elaps (*Elaps lemniscatus*) from Brazil, deposited; three Black Lemurs (*Lemur macaco* ♂ ♂ ♀), a White-fronted Lemur (*Lemur albifrons* ♂) a Red-fronted Lemur (*Lemur rufifrons* ♂) from Madagascar, a Cape Hyrax (*Hyrax capensis*) from South Africa, a Westerman's Cassowary (*Casuarius westermanni*) from New Guinea, two Pileated Jays (*Cyanocorax pileatus*) from La Plata, two White-faced Tree Ducks (*Dendrocygna viduata*), two Rufous Tinamous (*Rhynchotus rufescens*) from Brazil, two Tataupa Tinamous (*Crypturus tataupa*) from South America, an Argentine Tortoise (*Testudo argentina*) from the Argentine Republic, two Common Chameleons (*Chamæleon vulgaris*) from North Africa, two Aldrovandi's Lizards (*Plestiodon auratus*) from North-West Africa, purchased; two Mocassin Snakes (*Tropidonotus fasciatus*), born in the Gardens.

THE EXCITABILITY OF PLANTS[1]

IT will be in the recollection of many who are present this evening that in February of last year I had the honour of delivering a Friday evening discourse on a subject which included that which has been announced for to-night. In that lecture I had hoped to present to you a comprehensive view of the excitatory motions both of plants and of animals; that is, of those motions which they perform in response to transitory impressions received by them from outside. I was desirous that the statements that I made to you with reference to animal excitability should be as fully as possible illustrated by experiments, in the carrying out of which much more time was lost than I had reckoned for; so that I was unable even to enter on the second part of my subject. The time at my disposal will not permit me to summarise my last lecture, however advantageous it might be to do so. I must content myself with recalling your attention to one or two fundamental points.

Under the term excitability are comprised all cases in which some definite change in the behaviour of a living structure, whether it be a whole animal or a part, constantly arises as the result of some transitory external influence. But for the purpose in view, those cases only were included (typical of the rest) in which some sort of muscular motion is performed in response to an excitation or stimulus. The effect of such excitation we call the excitatory process, and we say, as the result of observation, that it consists of two phases or stages—namely, the phase of latency, and the phase of visible effect. These were illustrated in the last lecture by a series of experiments in which the excitable tissue of the heart of the frog was used. It was first shown with reference to this tissue that when it is touched (that is excited) with the tip of a glass rod, it undergoes a definite change of form, at the same time doing mechanical work at the expense of material contained in, but not forming part of, its own substance; secondly, that this mechanical effect did not begin until the lapse of an easily measurable period after the excitation, ; it was then pointed out that the interval of time between the prick and the visible or mechanical effect—the change of form, or contraction of the contractile substance—was one during which, though no visible change occurred in the excited part, molecular changes must certainly be in progress, and that these were accompanied by electrical disturbance.

To illustrate this, I demonstrated to you that the electrical change which in all cases accompanies excitation, precedes the mechanical one in time. You will remember that by means of the electric light the outline of the muscle to be excited and the image of the galvanometer mirror were projected on the screen, and that we were able to observe that when the muscle was pricked, the electrical disturbance had time to produce a deflection of the magnet which was visible on the screen before the muscle contracted.

It was further shown that an excitatory effect analogous to that which in muscle constitutes the first phase is produced in nerve, that in both the process of excitation is capable of being propagated in the same sort of way that an explosion is propagated in a train of gunpowder, and, finally, that the existence in nerve of this endowment is the instrumentality by which, in the human body, the will is able to influence and govern all the rest, and to receive influences from outside.

To-night we shall occupy ourselves exclusively with plants. I shall endeavour to show not only that they possess the wonderful property of excitability by which one part is able to influence another part at a distance, but that there is reason for believing that the excitability they possess is essentially of the same nature as that of animal tissue. And now, without further preface, I propose to enter on my subject by first giving you a short account of some of the most instructive instances of excitable plants.

The number of plants which exhibit what is often called irritability is very considerable. I will not weary you with even enumerating them. You will see from the table that they are distributed among a number of natural orders, so that one might be inclined to suppose that in this respect no relation could be traced between the physiological endowments and the morphological characters of a plant. That it is not so we have abundant evidence. Thus in the same genus we may find all the species excitable, though not in the same degree. The extreme sensitiveness of the Chinese Oxalis, formerly called *Biophytum sensitivum*, because it was supposed to be particularly alive, appears in a less degree, but equally distinctly in our own wood sorrel, as well as in the Tree Oxalis of Bengal—the Carambola,[1] which is described in an interesting letter addressed by Dr. Robert Bruce to Sir Jos. Banks, and published in the Philosophical Transactions. Again, in the same order, as, for example, among composite plants, we may have the Thistles, Knap-

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[1] Lecture delivered at the Royal Institution June 9, 1882, by Prof. Burdon Sanderson, F.R.S.

[1] An account of the sensitive quality of the tree Averrhoa Carambola. By Robert Bruce, M.D. *Phil. Trans.*, vol. lxxv. p. 356